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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/895,881	06/29/2001	Brad E. Paden	2673.2.1	5381

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EXAMINER	
SMITH, TYRONE W	

ART UNIT	PAPER NUMBER
2837	

DATE MAILED: 02/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/895,881	PADEN ET AL.	
	Examiner	Art Unit	
	Tyrone W Smith	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 4 and 7 - 67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 – 4 and 7 – 67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 3 objected to because of the following informalities: "*Currently amended*" should be deleted out of claim 3. Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 – 4 and 7 – 60 and 67 rejected under 35 U.S.C. 103(a) as being unpatentable over Barada et al (6404088), in view of Ueyama (6215218).

Regarding Claims 1, 7-17, 19-31, 33, 35-42, 45-51, 53-57, 59 and 67. Barada discloses a Magnetic Bearing Device, which includes a pair of positional displacement (Figure 2 item(s) 5-8) sensors to produce a displacement output (column 6 lines 15-16), an offset correcting means (Figure 3 item 19) and sensor gain adjuster (Figure 3 item 20) for producing an offset corrected signal from the positional displacement sensors and for adjusting the displacement output to account for a sensor offset (column 6 lines 33-35), position compensating means (Figure 2 item 13) for compensating for the offset corrected signal from the offset correcting means (column 6 lines 36-38), a control means (Figure 2 item 15) for converting the adjusted displacement output to a force for positioning the movable body and an actuator/driver (Figure 1 item 14) for positioning the movable body with force to a point of substantial equilibrium (column 6 lines 40-

56). Refer to abstract; column 2 lines 23-67, column 3 lines 1-40, column 4 lines 1-67 and column 5 lines 1-65; Figure(s) 3-5. However, Barada does not disclose a means for storing a plurality of displacement output and keeping the outputs in memory and disclosing a sensor for axial displacement.

Ueyama discloses a control magnetic bearing system (Figure(s) 3, 4 and 6). The system includes a displacement detection section (Figure 3 item 9) with three (plurality) displacement sensors (two ***radial*** and one ***axial***) (Figure 9 item(s) 23-25, column 6 lines 41-45) and a controller (Figure 3 item 2; column 6 lines 31-55) with a DSP board (Figure 6 item 16; column 6 lines 31-55). Refer to Figure 6; a sensor circuit (Figure 6 item 13; column 8 lines 23-52) receives displacement output information from the displacement detection section. The DSP board stores displacement and other information for further use (column 7 lines 33-67 and column 8 lines 1-3).

Regarding Claims 2-4, 18, 32, 34, 43-44, 52 and 60. Barada discloses converting the adjustment output to a force, inputting the adjustment output into a position controller/ control means (Figure 2 item 15; column 4 lines 12-40) and driver (Figure 1 item 14; column 4 lines 12-40) to determine the point of axial equilibrium (column 5 lines 21-52). Further, adjusting the displacement output to account for the sensor offset for estimating the sensor offset and adjusting the displacement output by the estimated sensor offset (column 4 lines 54-67 and column 5 lines 1-3). Barada discloses the system as a control feedback system for reset and continuous operation (Figure 2A items S1 and S2)

Regarding Claims 58. Barada discloses the control means (Figure 2 item 15; column 4 lines 12-40) controls the driver (Figure 1 item 14; column 4 lines 12-40) to successively energize the electromagnets to move the object along the auxiliary supports (column 4 lines 1-41-53), detecting maximum and minimum values of the detected positional replacement signal, which is

stored in the position compensating means (Figure 2 item 13; column 4 lines 54-67 and column 5 lines 1-3), from the positional displacement sensors. Further, calculating a middle value between a maximum value and minimum values and comparing the middle values with a predetermine threshold (column 6 lines 43-67 and column 7 lines 1-3).

It would have been obvious to one of ordinary skill in the art at the time in invention to combine Barada's invention of a Magnetic Bearing Device with Ueyama's control magnetic bearing system. The systems would provide a magnetic bearing control system capable of changing a control parameter according to the type of mechanical unit being used.

4. Claims 61, 65, 66 rejected under 35 U.S.C. 103(a) as being obvious over Antaki et al (6447266) in view of Barada et al (6404088).

Regarding Claim 61, 65 and 66. Antaki discloses a blood pump having a magnetically suspended rotor, which includes a housing comprising an inlet port and an outlet port for receiving and discharging fluid (column 31 lines 34-35), a rotor positioned within the housing for pumping blood between the housing's inlet port and outlet port (abstract; column 30 lines 34-55), a plurality of permanent magnets for passively controlling the radial position of the rotor radially, and the pitch and yaw of the rotor (column 30 lines 42-48 and column 31 lines 5-7), an electromagnetic motor for rotating the rotor about a central axis and an electromagnet for actively controlling the position of the rotor in the axial direction (column 30 lines 51-55 and column 31 lines 52-57), a sensor for measuring the axial displacement of the rotor (column 31 lines 58-59), a rotor position controller for positioning the rotor at the point of substantial axial equilibrium (column 31 lines 60-65), and an actuator for creating an electromagnetic force to position the rotor (column 10 lines 58-67, column 30 lines 51-55, and column 31 lines 52-57).

However, Antaki does not disclose an offset compensation module for adjusting an output of the sensor to account for sensor offset.

Barada discloses a Magnetic Bearing Device which includes an offset correcting means (Figure 3 item 19) and sensor gain adjuster (Figure 3 item 20) for producing an offset corrected signal from the positional displacement sensors and for adjusting the displacement output to account for a sensor offset (column 6 lines 33-35), position compensating means (Figure 2 item 13) for compensating for the offset corrected signal from the offset correcting means (column 6 lines 36-38).

It would have been obvious to one of ordinary skill in the art at the time of invention to use Antaki's a blood pump having a magnetically suspended rotor with Barada's a Magnetic Bearing Device. The combination of the two would provide a system that can provide magnetic suspension of the rotor and enhancing the biocompatibility and reliability of the pumps through geometric feature of the pumps while simultaneously minimizing the size of the pumps.

The applied reference has a common inventor (Mr. Bradley Paden) with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after

November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(l)(1) and § 706.02(l)(2).

5. Claims 62-64 rejected under 35 U.S.C. 103(a) as being unpatentable over Antaki et al (6447266) in view of Barada et al (6404088) as applied to claims 61, 65 and 66 above, and further in view of Ueyama (6215218).

Regarding Claims 62-64. Antaki discloses a blood pump having a magnetically suspended rotor and Barada discloses a Magnetic Bearing Device as described in the previous rejection. However, neither Antaki nor Ueyama discloses a computer for controlling and storing data in operating the pump apparatus or similar.

Ueyama discloses a control magnetic bearing system (Figure(s) 3, 4 and 6), which includes a controller (Figure 3 item 2; column 6 lines 31-55) with a DSP board (Figure 6 item 16; column 6 lines 31-55). Refer to Figure 6; a sensor circuit (Figure 6 item 13; column 8 lines 23-52) receives displacement output information from the displacement detection section. The DSP board stores and recalls sensor data for controlling the system (column 7 lines 33-67 and column 8 lines 1-3).

It would have been obvious to one of ordinary skill in the art at the time of invention to use Ueyama's a control magnetic bearing system with Antaki's a blood pump having a magnetically suspended rotor and Barada's a Magnetic Bearing Device. The combination the invention would provide a magnetic bearing control system or similar capable of changing a control parameter according to the type of mechanical unit being used.

Examiner's Response

5. Applicant's arguments filed January 14, 2004 regarding claims1 – 4 and 7 – 60 and 67 have been fully considered but they are not persuasive. With respect to claims 61-66 have been considered but are moot in view of the new ground(s) of rejection.

The applicant argues that the claims (1 – 4 and 7 – 60 and 67), as currently amended, overcome the 35 U.S.C. 103 rejection (Barada in view of Ueyama). Applicant argues that the invention uses one sensor being an axial displacement sensor and that the two references give no suggestion to omit the radial displacement sensors and data.

Examiner believes that the current rejection still reads on the claims, where Barada uses radial sensors and Uyeama both uses axial and radial sensors. As admitted by the Applicant on page 16 paragraph 1, Uyeama discloses an (one) axial sensor (within the displacement detection section) for measuring the axial position of the movable body and produce an axial displacement output as required in the claims. Refer to Figure 9 item(s) 23-25, column 6 lines 41-45. Uyeama with Barada can still perform the same tasks radial and axially. Using both types of sensors does not take away from the current invention it can only provide an enhancement. As stated above the references still read on the claims as presented of using an axial displacement sensor, which is disclosed in Uyeama therefore the rejection based on 35 U.S.C. 103 is maintained. If the applicants want to discuss the claims and reference further do hesitate to contact the Examiner.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tyrone W Smith whose telephone number is (571) 272-2075. The examiner can normally be reached on weekdays from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi, can be reached on (571) 272-2071. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tyrone Smith
Patent Examiner

Art Unit 2837

RINA DUDA
PRIMARY EXAMINER